

ness. The effect of contact in producing or maintaining difference of potentials would be perceived by a difference in electric brilliancy, and this difference would vary with each re-arrangement of the objects. Every movement of our body, each touch of our hand, and the very friction of our clothes, would cause a play of effects analogous to those of light and shadow on the eye, while more highly electrified matter would bring into prominence by induction electrical differences between surrounding bodies. This speculation, however fanciful, helps us to conceive the omnipresence of electricity; and since the mechanical conditions required to excite sensation are fulfilled in the electrical relations between bodies at different potentials, there does not seem any very great boldness in suggesting that some living things may have an *electrostatic sense* so far developed as to be of use to them" (page 51).

Altogether this little work forms a very suitable introduction to its author's much more advanced and well-known "Textbook of Electricity and Magnetism."

*The Natural History of the Cranes.* A Monograph by the late Edward Blyth. Greatly enlarged and reprinted with numerous illustrations by W. B. Tegetmeier. (Published for the Author, 1881.)

THIS is an excellent monograph of an exceedingly interesting group of birds. On the arrival in 1873 of a pair of the beautiful white-naped cranes of Japan in London they were drawn by Mr. T. W. Wood for the *Field* newspaper, and the late Edward Blyth took the opportunity of publishing in the columns of that paper a monograph of all the then known species of crane. At the suggestion of Prof. A. Newton, Mr. Tegetmeier has republished these notes, inserting however much new matter that either want of space had prevented Blyth from incorporating, or that had come to hand since Blyth's death. Thus we have Wolley's graphic account of the nesting of the common crane in Lapland, Dr. Cullen's account of the nesting of the Demoiselle in Bulgaria, and even Col. Prjevalsky's account of a new species found at Koko-nor. Sixteen species, two belonging to the genus *Balearica* and fourteen to the genus *Grus*, are described. Mr. Wood's figures of *Grus leucauchen* are reproduced. There is a facsimile of the coloured figure of *Grus nigricollis* from Col. Prjevalsky's "Birds of Mongolia"; a spirited sketch by Prof. W. H. Flower of flocks of *Grus virgo* on the banks of the Nile; some copies of studies of cranes from Mr. Cutler's beautifully-illustrated work on Japanese ornament (charming studies); and a few woodcuts of anatomical details.

Cranes of one or more species are found everywhere, with the exception of South America, the Malayan and Papuan Archipelagos, and the scattered islands of the Pacific. The common European species, celebrated in all times for its migrations—

"So steers the prudent crane  
Her annual voyage, borne on winds; the air  
Floats as they pass, fann'd with unnumber'd plumes"—

was at one time very numerous in the fenny districts of England; so possibly Milton knew the bird. The name is quite wrongly applied to the heron in Scotland and Ireland, while in America and Australia the white egret herons are also called cranes. Old Æsop's fable of the stork being captured in the evil companionship of the cranes, and being condemned to death for thus even associating with notorious plunderers of grain, indicates that he well enough knew the two kinds of birds; far better indeed, as Blyth truly remarks, than did that renowned master of mediæval painters, who commits the curious zoological mistake of introducing cranes instead of storks in his world-known cartoon of the Miraculous Draught of Fishes.

In common with many other gregarious birds, cranes always place sentinels as a lookout, while the rest of the

flock will trustfully repose; and they likewise leave them on the watch while on their marauding expeditions to crops of grain.

*Zoological Atlas (Including Comparative Anatomy)*

With practical directions and explanatory text for the use of students. 231 coloured figures and diagrams. By D. McAlpine. Vertebrata. (W. and A. K. Johnston, 1881).

THE object of this work is to help the student in the examination and dissection of the leading types of animal life. The author quotes Dr. Macalister's words, "That in a practical science such as zoology it is only by the examination of specimens that any knowledge of the science worth acquiring can be obtained, and the function of a book is to assist in practical study." Bearing this in mind, he has here tried to assist the student by giving descriptions and drawings of one selected specimen from each group of the vertebrates. The skate and cod have been chosen to represent the cartilaginous and bony fishes respectively; the salamander to represent the tailed amphibia; the tortoise to represent the reptiles; and the pigeon and rabbit to represent the birds and mammals. The various systems are well represented, with the exception of the muscular system, which perhaps has been wisely overlooked. There can be no doubt but that this Atlas will form an important addition to the working student's books. It should remove many elementary difficulties from his path.

#### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

#### Dr. Carnelley's Experiment with Mercuric Chloride

I WAS a little surprised to notice from a paragraph in Prof. McLeod's letter in *NATURE*, vol. xxiv. p. 28, that he had been unable to repeat Dr. Carnelley's experiment with mercuric chloride. Immediately after the publication of my former letter, it was remarked to me, that although I had shown hot ice to be an impossible commodity, perhaps Dr. Carnelley's assertion of the existence of solid mercuric chloride above its boiling point might still hold. I therefore repeated this experiment, and after overcoming a few preliminary difficulties, obtained a result similar to that with ice. The difficulties were these:—After solidifying a cylinder of mercuric chloride round the thermometer (to which it adhered at first), on heating, the mercuric chloride soon became detached and fell from the thermometer. It had therefore to be sustained in position round the thermometer, by a stout iron or copper wire. Another difficulty arose from the fact that the mercuric chloride soon became deeply pitted and fissured, so much so, that the thermometer was sometimes seen through holes a quarter of an inch deep. This pitting went on till the mercuric chloride cylinder, though not much reduced in diameter, became a mere network, the thermometer being visible in many places. The erosion seemed to take place more quickly next the bulb; making the holes in the cylinder widest at the interior. Another difficulty lay in the high temperature causing, as Prof. McLeod noticed, the rupture of the thermometer thread; but by using a very good thermometer, and keeping it as nearly vertical as was convenient, this was entirely obviated. A large condenser is not required, and I only used a piece of combustion tubing fully an inch in diameter and about twenty inches long, the thermometer with the cylinder of mercuric chloride being inserted at one end, and a tube connected with a Sprengel pump at the other. The results obtained are as follows:—Melting point of mercuric chloride, 271° (uncorr.); boiling point, 291° (uncorr.). The pressure was now reduced to 400 mm., and the tube heated until the temperature was constant, the pressure again reduced, another reading taken, and so on until a vacuum was reached, or the cylinder had become too porous to give correct readings.

By the use of Gimmingham's form of pump the exhaustion can be increased in a very short time, and the readings all obtained from one cylinder an inch in diameter. Three series of readings were taken agreeing very well with each other. At first there were discrepancies, owing to the porosity of the cylinder not being noticed, but these disappeared when care was taken. The temperatures were not corrected, as the results were not intended for publication, as I expected some other worker to repeat the experiment, but that not being the case I give the numbers as they are, premising that the temperatures, if corrected, would be 6° or 7° higher for the upper and 4° to 6° for the lower ones. The following are the numbers obtained :—

Pressure in millimetres.	Temperature of volatilisation.	Pressure in millimetres.	Temperature of volatilisation.
400 ... ..	270 ... ..	40 ... ..	233
300 ... ..	267 ... ..	30 ... ..	228
200 ... ..	263 ... ..	20 ... ..	223
100 ... ..	253 ... ..	10 ... ..	214
80 ... ..	248 ... ..	5 ... ..	205
60 ... ..	242 ... ..	0 ... ..	185

A determination done before those given above gave—

Pressure in millimetres.	Temperature of volatilisation.
68 ... ..	245
10 ... ..	222
5 ... ..	210

But I do not place the same confidence on these numbers, as they were obtained in ignorance of the porosity of the solid; but they confirm the others. It appears from the above that mercuric chloride is no exception to the general law which makes the volatilising point rise or fall with the pressure. The low latent and specific heats of mercuric chloride make it not nearly so suitable an exponent of the truth of Regnault's conclusions as water; the latter allowing of a whole hour's continued experiment. I think after these experiments the idea of being able to raise solids in vacuo to temperatures above their ordinary volatilising or boiling points may be dismissed as inadmissible, except it may be in some rare case of allotropy. J. B. HANNAY

Private Laboratory, Sword Street, Glasgow

### The Conservation of Electricity

By the kind permission of Messrs. Macmillan and Co. I am allowed to quote the following paragraph from the preface to my "Elementary Lessons in Electricity and Magnetism," shortly to be published by them in their School Class Books Series, and now in the press. The preface is dated "March, 1881."

"The theory of Electricity adopted throughout is that Electricity, whatever its nature, is *one*, not *two*: that Electricity, whatever it may prove to be, is not *matter*, and is not *energy*: that it resembles both matter and energy in one respect, however, in that it can neither be created nor destroyed. The doctrine of the *Conservation of Matter*, established a century ago by Lavoisier, teaches us that we can neither destroy nor create matter, though we can alter its distribution and its forms and combinations in innumerable ways. The doctrine of the *Conservation of Energy*, which has been built up by Helmholtz, Thomson, Joule, and Mayer, during the last half century, teaches us that we can neither create nor destroy energy, though we may change it from one form to another, causing it to appear as the energy of moving bodies, as the energy of heat, or as the static energy of a body which has been lifted against gravity or some other attracting force into a position whence it can run down, and where it has the potentiality of doing work. So also the doctrine of the *Conservation of Electricity*, which is now growing into shape,<sup>1</sup> but here first enunciated under this name, teaches us that we can neither create nor destroy electricity, though we may alter its distribution—may make *more* to appear at one place and *less* at another—may change it from the condition of rest to that of motion, or may cause it to spin round in whirlpools or vortices which themselves can attract or repel other vortices. According to this view all our electrical machines and batteries are merely instruments for altering the distribution of electricity

<sup>1</sup> This is undoubtedly the outcome of the ideas of Maxwell and of Faraday as to the nature of electricity. It has nowhere been more excellently or pithily put into shape than in a discourse delivered by Dr. Oliver J. Lodge before the London Institution, "On the Relation between Light and Electricity," December 16, 1880 (NATURE, vol. xxiii. p. 302).

by moving some of it from one place to another, or for causing electricity, when heaped up in one place, to do work in returning to its former level distribution. Throughout these Lessons the attempt has been made to state the facts of the science in language consonant with this view, but rather to lead the young student to this as the result of his study than to insist upon it dogmatically at the outset."

The above paragraph is published at the present time because, since the date when my manuscript was sent to the publishers, a memoir has been presented to the Académie des Sciences bearing the title, "Sur le Principe de la Conservation de l'Électricité, ou seconde Principe de la Théorie des Phénomènes Électriques." Of this memoir, which is by M. G. Lippmann, only a brief extract has as yet been published in the *Comptes rendus* of the sitting of May 2, when it was read. In that short extract the general doctrine of the conservation of electricity is laid down with considerable clearness, and an elegant analytical expression of it is given in the briefest form, the author promising some examples of its application to the prediction of new and important phenomena. The publication of the complete memoir of M. Lippmann will no doubt be awaited with interest.

As my manuscript was placed in the hands of Messrs. Macmillan and Co. on the very day when the above extract was written, the phraseology used by M. Lippmann must have been adopted by him in entire independence of me. Since some weeks must elapse before my "Elementary Lessons" will be in the hands of the public, I wish to avoid, meantime, all chance of misunderstanding by taking the earliest opportunity, firstly, of making this acknowledgment, which is due to M. Lippmann, and secondly, of establishing my right to use the language of my preface as to the explicit enunciation of the doctrine of the *Conservation of Electricity*.

SILVANUS P. THOMPSON

University College, Bristol, May 19

### The Florence Herbarium

I BEG to forward to you the inclosed protest of the botanists of Florence against the proposed removal of the Herbarium and adjoining Botanical Garden at Florence to a new locality in that city.

It is well known to all botanists who have visited that city that, taking into account the importance of the herbarium, the admirable building in which this and the other collections are lodged, and the annexed botanical garden, the establishment at Florence deserves to rank amongst the first in the world, and is indeed scarcely second to any except that at Kew. It has an especial interest in the eyes of Englishmen, owing to the fact that it includes the invaluable collections of the late Mr. Barker Webb, which include, besides the type specimens of the Canary Island flora and of his other works, those still more important of Labillardière, of Rinz and Pavon, and of Desfontaines, whose herbaria all passed into his hands.

Although well acquainted with the Florence Museum, and disposed to believe that it would be difficult to find another locality equally well adapted for the purpose, I was unwilling to express any opinion on the subject without full information as to the new arrangements proposed in substitution for those now so excellent.

Within the last month my friends Sir Joseph Hooker and Dr. Asa Gray have visited Florence, and have carefully examined the present building and its appurtenances, and also the sites to which it is proposed to remove the herbarium and botanic garden. I learn that they have expressed an unqualified opinion that the proposed new building is altogether unsuited for the purpose, and would too probably tend to the injury and ultimate loss of the herbarium, while the site of the proposed botanic garden is also an unfavourable one.

Sir Joseph Hooker has written a full statement of his views to Prof. Carnel, recently appointed Director of the Botanical Museum, who has not, I believe, as yet published his opinion on the subject.

Under these circumstances I venture to hope that you will publish the accompanying document, with a view to prevent the accomplishment of a design so injurious to natural science. Those who wish to associate their names with the protest are invited to send them to M. E. Sommier, Lung'Arno, Corsini, Florence.

JOHN BALL

10, Southwell Gardens, London, S.W., May 20